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2.00AJ / 16.00AJ Exploring Sea, Space, & Earth: Fundamentals of Engineering Design
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Procedure for calibrating sensor data 05/06/09

The key to calibrating your sensor is to have at least two data points for pressure. By taking data at a specific depth and measuring the distance from the surface to your ROV, you can relate your sensor's raw pressure data to that depth by using the barometric formula. (Hint: A string tied to the vehicle or your tether would work.) Remember that you also have another data point at the surface.

You would have to know what part of your raw sensor data relates to this depth. Ex. Dive to the bottom of the river and measure the depth. This way you will know that the highest value of your raw pressure data is taken at that depth. Alternatively you could take measurements at a specific depth for a set amount of time and afterwards look for a fairly constant value in the data that correlates to this length of time.)

Now that you know the pressure at these two or more locations you can calculate the constant that transforms the raw data (Volts) into useful pressure measurements (kPa or Psi).

Finally you can extrapolate this to your temperature, light, and conductivity readings as you also have actual data from instruments we used to take readings at the pavilion (Provided below)

Sailing Pavilion Calibration Data 04/29/09 =====

Conductivity:

- 0 S/m in air
- 1.7 S/m at surface

Temperature:

- Air: 16 deg C/61 deg F in shade
- Air: 17 deg C/63 deg F in sun
- Surface: 18 deg C/65 deg F
- Length of rod: 18 deg C (60 cm below surface)
- Length of Cable: 18 deg C (1.2 m below surface)

Light:

- 1016 lux in shade
- >32000 lux in direct sunlight

Sailing Pavilion Calibration Data 05/01/09 =====

Conductivity:

- 0 S/m in air
- 1.7 S/m at surface

Temperature:

- Air: 19 deg C/67 deg F in shade
- Air: 19 deg C/67 deg F in sun
- Surface: 17 deg C/64 deg F

- Length of rod: 17 deg C/63 deg F (60 cm below surface)
- Length of Cable: 17 deg C/63 deg F (1.2 m below surface)

Light:

- 1012 lux in shade
- >32000 lux in sun